

CLAIMS

I claim:

1. A method for producing a die insert for engaging tubular members comprising the steps of:
 - 5 a. providing a metal die body having a first hardness and a front and rear surface, said rear surface being shaped for insertion into a tubular gripping apparatus;
 - b. coating at least a portion of said front surface with a granular particle coating and a brazing matrix; and
 - c. heating said die body until said brazing matrix melts, thereby adhering said
10 granular particles to said front surface and softening said metal to a second lesser hardness, such that said front surface may engage a tubular member with sufficient force to embed said granular particles in said front surface without reducing the standard diameter of the tubular member.
2. A method according to claim 1, wherein said step of heating said die body includes
15 heating said die body at a temperature between about 150 °C and about 1400 °C.
3. A method according to claim 1, wherein said step of heating said die body includes heating said die body at a temperature between about 600 °C and about 1400 °C.
4. The method according to claim 1, wherein said step of providing a die body includes providing a die body having a concave arcuate shape for gripping the outer perimeter of a tubular
20 member.
5. The method according to claim 1, wherein said step of providing a die body includes providing a die body having a substantially planar front surface.

6. The method according to claim 1, wherein said step of heating includes heating said granular particle coating and said a brazing matrix to a temperature sufficient to cause said brazing matrix to reach at least a semi-solid state.

7. The method according to claim 1, wherein said heating step includes heating said front surface sufficiently to obtain a hardness of approximately 70 HRB.

8. The method according to claim 1, wherein said granular particle coating includes a refractory metal from the group consisting of the carbides of silicon, tungsten, molybdenum, chromium, tantalum, niobium, vanadium, titanium, zirconium, and boron.

9. A die insert for engaging tubular members produced by the process comprising the steps of:

a. providing a metal die body having a first hardness and a front and rear surface, said rear surface being shaped for insertion into a tubular gripping apparatus;

b. coating at least a portion of said front surface with a granular particle coating and a brazing matrix;

15 c. heating said die body until said brazing matrix melts, thereby adhering said granular particles to said front surface and softening said metal to a second lesser hardness; and

20 d. thereby producing a die with a softened metal body such that said front surface may engage a tubular member with sufficient force to embed said granular particles in said front surface without reducing the standard diameter of the tubular member.

10. A method for producing a die insert for engaging tubular members comprising the steps of:

a. providing a metal die body having a first hardness and a front and rear surface, said rear surface being shaped for insertion into a tubular gripping apparatus;

5 b. coating at least a portion of said front surface with a granular particle coating having a second hardness greater than said first hardness; and

c. adhering said granular particle coating to said front surface such that said front surface may engage an oilfield tubular member with sufficient force to embed said granular particles in said front surface without reducing the standard diameter of the
10 tubular member.

11. The method according to claim 10, wherein said step of adhering said granular particle coating to said front surface is accomplished using a low temperature curing adhesive.

12. The method according to claim 10, wherein said step of adhering said granular particle coating to said front surface is accomplished using a brazing matrix with a melting point less
15 than approximately a transformation starting temperature for said metal front surface.

13. The method according to claim 10, wherein said step of adhering said granular particle coating to said front surface is accomplished using a thermal spray process wherein a molten metallic brazing matrix mixed with granular particles is sprayed onto said front surface in a manner which does not raise the temperature of said front surface above a transformation
20 temperature for said metal front surface.

14. The method according to claim 9, wherein said step of providing a die body includes providing a die body having a substantially planar front surface.

15. The method according to claim 10, wherein said step of providing a die body includes providing a die body having a substantially planar front surface.